

I CLAIM:

1. A system for monitoring a gas/oil well, comprising:  
a monitoring unit at a well head, the monitoring unit including a wireless transmitter consuming power at a safe level for avoiding an explosion risk;  
5 a relay unit including a wireless receiver communicating with the monitoring unit transmitter and further including a telephone communication link;  
a host interface communicating with the relay unit through the telephone communication link.
- 10 2. The system of Claim 1, wherein the monitoring unit senses a condition of the gas/oil well.
3. The system of Claim 2, wherein the monitoring unit senses pressure level.
4. The system of Claim 2, wherein the monitoring unit senses temperature.
- 15 5. The system of Claim 2, wherein the monitoring unit senses the presence or absence of flame.
6. The system of Claim 1, wherein the wireless transmitter consumes less than about 0.75 mW of power.
7. The system of Claim 1, wherein the telephone communication link  
20 comprises a cellular connection.
8. The system of Claim 1, wherein the wireless transmitter of the monitoring unit is part of a monitor transceiver and the wireless receiver of the relay unit is part of a relay transceiver.
9. The system of Claim 8, wherein the monitoring unit includes a gas tight  
25 box housing sensor processing electronics.
10. The system of Claim 9, wherein the monitor transceiver is located outside of the gas tight box.
11. A system for monitoring a gas/oil well, comprising:  
a monitoring unit located within a danger zone, the monitoring unit  
30 including a wireless monitor transceiver and sensor processing electronics, the sensor processing electronics housed in a gas tight box;

a relay unit including a wireless relay transceiver communicating with the monitor transceiver.

12. The system of Claim 11, wherein the sensor processing electronics processes sensor data and incoming communications from the relay unit.

5 13. The system of Claim 12, wherein the sensor data includes pressure data.

14. The system of Claim 12, wherein the sensor data includes temperature data.

15. The system of Claim 12, wherein the sensor data includes information on the presence of a flame.

10 16. The system of Claim 11, wherein the relay unit communicates via a wireless telephone connection with a host interface.

17. The system of Claim 11, wherein the relay unit communicates via a LAN line with a host interface.

18. An apparatus for monitoring a gas/oil well, comprising:  
15 a gas tight housing, the gas tight housing containing sensor processing electronics; and

an RF transceiver, the RF transceiver located outside the gas tight housing and in electrical communication with the sensor processing electronics inside the gas tight housing.

20 19. The apparatus of Claim 18, wherein a transmitter of the RF transceiver uses less than or equal to about 0.75 mW of power.

20. A method for monitoring a gas/oil well, comprising:  
sensing a condition of the gas/oil well at the gas/oil well site;  
waking up a CPU in the monitoring unit;  
25 transmitting the sensed condition from the gas/oil well site to a relay unit over a wireless link.

21. The method of Claim 20, wherein the transmitting over a wireless link is accomplished by an RF transmitter.

30 22. The method of Claim 20, wherein the CPU is located inside a gas tight box.

23. The method of Claim 21, wherein the RF transceiver is located outside a gas tight box, wherein the gas tight box houses the CPU.

24. A method of communicating to and from an explosive environment, comprising:

5           situating a first transceiver in said explosive environment, said transceiver operating at a power level which is below the level defined as dangerous within said explosive environment;

          situating a second transceiver proximate to but outside of said explosive environment, said second transceiver operating at a power level which is above  
10       the level defined as dangerous within said explosive environment; and

          communicating with said first transceiver through said second transceiver from a location outside of said explosive environment and not proximate to said explosive environment.

25. Apparatus for communicating to and from an explosive environment, comprising:  
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          a first transceiver in said explosive environment, said transceiver operating at a power level which is below the level defined as dangerous within said explosive environment;

          a second transceiver proximate to but outside of said explosive environment, said second transceiver operating at a power level which is above  
20       the level defined as dangerous within said explosive environment; and

          a third transceiver outside of said explosive environment and not proximate to said explosive environment which is configured to communicate with said first transceiver through said second transceiver.

26. A method of communicating to and from an explosive environment, comprising:  
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          situating a first transceiver in said explosive environment, said transceiver having a short, first range and operating at a low, first power level;

          situating a second transceiver outside said explosive environment but  
30       within said short, first range, said second transceiver having a longer, second range and operating at a higher, second power level;

situating a third transceiver outside said explosive environment, outside said short, first range, but within said second, longer range; and

communicating between said first and third transceivers through said second transceiver.

5           27.   Apparatus for communicating to and from an explosive environment, comprising:

          a first transceiver positioned in said explosive environment, said transceiver having a short, first range and operating at a low, first power level;

10           a second transceiver positioned outside said explosive environment but within said short, first range, said second transceiver having a longer, second range and operating at a higher, second power level; and

15           a third transceiver positioned outside said explosive environment, outside said short, first range, but within said second, longer range, said third transceiver configured to communicate with said first transceiver through said second transceiver.